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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,749	09/06/2006	Masafumi Hashimoto	SPL-06-1222	3421

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EXAMINER
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JACKSON, MONIQUE R

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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09/16/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,749	<b>Applicant(s)</b> HASHIMOTO ET AL.	
	<b>Examiner</b> Monique R. Jackson	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/6/06</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 7-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The incorporation of the term "about" in Claims 7, 8 and 9 extends the numerical ranges for the core layer thickness, "thin-layer" thickness, and tensile modulus, respectively, beyond the ranges that were recited in and supported by the original disclosure at the time of filing.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 includes a parenthetical expression at lines 3-4 and it is unclear whether the limitation within the parenthesis is meant to be part of the claimed invention.
5. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 recites the limitation "the aromatic diamine" in lines 1-2. There is

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insufficient antecedent basis for this limitation in the claim given that Claim 5 depends upon Claim 1 and Claim 1 recites polyimide A and polyimide B but no aromatic polyimide or aromatic diamine.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-5 and 7-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Okamura et al (WO02/064353, see USPN 7,338,716.) Okamura et al teach a laminate useful for flexible printed circuits comprising an insulating polyimide resin layer and a metal foil, preferably copper foil, wherein the insulating resin layer is composed of a plurality of polyimide resin layers on the metal foil and the insulating resin layer has at least one polyimide resin layer (A) with a coefficient of linear expansion (CTE) of  $30 \times 10^{-6} / ^\circ\text{C}$  or less, and at least one polyimide resin layer (B) with a glass transition temperature ( $T_g$ ) of  $300^\circ\text{C}$  or below and in contact with the metal foil (Abstract, Col. 3, lines 36-57.) Okamura et al teach various structures comprising multiple metal foils, multiple A layers and multiple B layers, as shown in Col. 3, lines 1-5, which read upon the claimed structure; wherein the laminates can be formed by successive coating of a solution of the polyimide resin A or B or precursors thereof to the metal foil, a polyimide

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substrate formed therefrom, or a previously applied layer of either A or B, followed by drying and/or laminating by thermocompression bonding, and curing; wherein the polyimide precursor solutions are produced by the same tetracarboxylic dianhydrides and diamines as instantly claimed; wherein one layer reads upon the claimed high rigidity and low linear expansion layer and the other reads upon the claimed highly heat-resistant amorphous layer (Col. 2, line 8-Col. 5, line 67, Col.6, line 6-Col. 7, line 21, Col. 7, line 63-Col. 8, line 27; Examples.) Okamura et al also teach that additives can be included to accelerate the imidation reaction and further, it is possible to add a silane coupling agent, filler or other additives as needed (Col. 7, lines 50-62.) Okamura et al further teach that the insulating resin layer(s) as whole have a CTE of less than 30 and that the layers can have a thickness range and ratio as recited in Col. 7, line 63-Col. 8, line 22 (Col. 7, line 63-Col. 8, lines 23-28.) With respect to the claimed tensile modulus, the Examiner takes the position that the flexible film taught by Okamura et al which is produced by the same polyimide resin layers as instantly claimed, would inherently have a tensile modulus within the claimed range given that the polyimide resin layers are formed by the same process using the same polyamic acid precursor solutions.

8. Claims 1-5 and 7-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Shigeta et al (WO01/97578; see USPN 6,962,726.) Shigeta et al teaches a substrate for a flexible print wiring board excellent in heat resistant, having a polyimide based resin layer wherein a solution of a polyimide based resin precursor is directly applied on an electrically conducting material to form a polyimide based resin precursor layer and then the precursor layer is cured by heating to prepare a polyimide based resin layer, characterized in that a solution of a polyimide based resin precursor B, which is one of solutions of two types of polyimide based resin precursors, is

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directly applied on an electrically conducting material and then, on the resultant layer is applied a solution of a polyimide based resin precursor A on the B layer followed by curing; wherein Shigeta et al further teach that a silane coupling agent may be added to the solutions for improvement of adhesion or adhesiveness (Abstract; Col. 9, lines 23-29; Col. 11, lines 15-18.) Shigeta et al also teach the same polyimide precursor solutions as instantly claimed including the same tetracarboxylic dianhydrides and diamines, wherein the resulting layers are applied to a desired thickness with a thickness ratio as taught in Col. 11, and the resulting polyimide-based resin layer as a whole as an average linear expansion coefficient of 10 to 40ppm, with either layer A or B having a higher or lower linear expansion coefficient than the other (Col. 3-Col. 10, lines 34; Examples.) With respect to the claimed tensile modulus, the Examiner takes the position that the flexible polyimide film taught by Shigeta et al which produced by the same polyimide resin layers as instantly claimed, would inherently have a tensile modulus within the claimed range given that the polyimide resin layers are formed by the same process using the same polyamic acid precursor solutions.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura et al.

The teachings of Okamura et al are discussed above. Though Okamura et al teach that a silane coupling agent can be further include in any of the polyimide precursor solutions, Okamura et al

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do not specifically teach that the silane coupling agent is an aminosilane or epoxysilane, however, aminosilanes as well as epoxysilanes are obvious species of conventional coupling agents utilized in the art and would have been obvious to one having ordinary skill in the art at the time of the invention. Additionally, it is noted that titanate coupling agents are functionally equivalent to silane coupling agents in the art and also would have been obvious to one skilled in the art at the time of the invention.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeta et al. The teachings of Shigeta et al are discussed above. Though Okamura et al teach that a silane coupling agent can be further include in any of the polyimide precursor solutions, Shigeta et al do not specifically teach that the silane coupling agent is an aminosilane or epoxysilane, however, aminosilanes as well as epoxysilanes are obvious species of conventional coupling agents utilized in the art and would have been obvious to one having ordinary skill in the art at the time of the invention. Additionally, it is noted that titanate coupling agents are functionally equivalent to silane coupling agents in the art and also would have been obvious to one skilled in the art at the time of the invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R. Jackson whose telephone number is 571-272-1508. The examiner can normally be reached on Mondays-Thursdays, 10:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Monique R Jackson/  
Primary Examiner, Art Unit 1794  
September 13, 2008